DOCUMENT RESUME

ED 106 142 SE 019 162

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TITLE The Effects of Pre-Remedial Instruction on Low Achievers' Math Skills and Classroom Participation.
PUB DATE Apr 75
NOTE 7p.; Paper presented at the annual meeting of the American Educational Research Association (Washington, D.C., March 30 - April 3, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS Educational Diagnosis; Effective Teaching; Elementary Education; *Elementary School Mathematics; *Instruction; *Low Achievers; Mathematical Concepts; Readiness; *Remedial Arithmetic; *Research; Tutoring

ABSTRACT

The purpose of this study was to measure the effects of tutoring low achievers on the concepts of carrying and borrowing before they were introduced in the classroom. Twelve low-achieving second-grade students were tutored on these concepts. The tutored children, along with members of two control groups, participated in a pretest covering these ideas. After the two-week tutoring period, members of all three groups participated in a mock classroom. The pre-remediated children performed significantly better than control group members on both types of problems (p less than .01), as well as in classroom participation (p less than .05). (Author/SD)

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THE EFFECTS OF PRE-REMEDIAL INSTRUCTION ON LOW ACHIEVERS' MATH SKILLS AND CLASSROOM PARTICIPATION[1]

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ABSTRACT

The purpose of this study was to measure the effects of tutoring low achievers on concepts not previously introduced in the classroom. Twelve low achieving second graders were tutored in two math concepts. At the end of two weeks a mock classroom was held. The tutored children, along with a random sample of their peers (control group 1) and other low achievers (control group 2) participated in the mock classroom. It was found that the pre-remediated children performed significantly better than children in either control group both on math skills (.01) and classroom participation (.05).

Since the advent of standardized intelligence testing at the turn of the century, children have been placed in special classes according to their relative ranking on a small set of intellectual tasks (Binet and Simon, 1916). The practice of assigning low achievers to a self-contained special education classroom has met with little success. In a classic study on intellectual labeling, Jane Mercer (1972) concluded that most "retarded" children were not "retarded" at all and that more attention should be given to the design of instruction that would allow teachers to meet the individual needs of low

[1]Paper presented at the annual meeting of the American Educational Research Association, Washington, D. C., April, 1975.

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achievers. Coleman (1965) produced convincing data to suggest that the self-contained classroom was not the answer. Hoeltke (1967) concluded that the special education classroom actually had negative effects on low achievers' performance.

In a review of compensatory programs, Gordon (1970) concluded that "Project evaluations in general indicate that compensatory education has failed" (p. 9). He suggests that children must be reached early by effective remediation, if we are going to have any long range effects on a student's performance.

The results of previous research indicate that several requirements must be met before a special education program can expect to succeed. First, the program should avoid labeling children. Second, there should be a broad range of instructional programs specifically designed to meet each child's educational needs. Third, the child should spend a major portion of the day in his regular classroom. Fourth, the program should provide for individualized instruction. Fifth, there should be a built-in means by which the program can be evaluated and improved. Sixth, the special help should come as soon as possible in the child's education. Seventh, the terminal goal of a successful program should be the elimination of the child's need for it.

An experiment was conducted whose treatment characteristics seemed consonant with the seven requirements previously stated. We will label the approach as pre-remedial instruction. When a child is pre-remediated,

he is individually tutored on a topic before his classmates reach it. The express purpose of this study was to answer two questions:

1) Do pre-remediated children perform better than their classmates when the new topic is presented in the classroom?

2) Are there concomitant effects on a pre-remediated child's tendency to participate in classroom discussion?

Selection of Subjects

From two second grade classes in a rural school, 12 students were selected at random and labeled as control group 1. They represent all second graders in the school. Twenty-four of the remaining second graders were identified as low achievers by their teachers. Of these 24 Ss, 12 were assigned to control group 2. Two control groups were used in this study to provide a dual base for comparing responses in the experimental group.

Procedures

A pretest was given to all Ss in the experimental group and both control groups. This test consisted of 131 free response items designed to evaluate a child's understanding of the basic math skills of carrying and borrowing ("regrouping"). The test also contained items which measured the child's knowledge of 14 prerequisite subskills such as, naming numbers, counting, place value and the meaning of mathematical signs. These subskills were identified using an extensive task analysis procedure. With the exception

of one student in control group 2, no student was able to solve problems involving borrowing and carrying.

To act as tutors for Ss in the experimental group, 12 sixth graders were trained in the principles of structured tutoring (Harrison, 1971; Osguthorpe and Harrison, 1974). Nine lessons covering the necessary concepts and rules of carrying and borrowing were developed for use by these tutors. After two weeks of daily tutoring for twenty minute sessions, each of the 12 low achievers had completed the required lessons.

A mock classroom was held to compare the effectiveness of the pre-remedial instruction with typical classroom instruction on carrying and borrowing. All students in the experimental group and both control groups participated in this mock classroom for a class size of 36.

An unfamiliar certified teacher presented carefully worded instruction on carrying and borrowing. Worksheets containing addition and subtraction problems requiring carrying or borrowing were then distributed to the students. Trained college age observers were also in the classroom. They tabulated the classroom behavior of the students using an observation form designed specifically for the present study. Student responses such as hand raising and question answering were recorded on the behavioral observation form.

Results

Students in the experimental group (those who were tutored) correctly worked an average of 18.42 out of 20 problems on the worksheet in the mock classroom. Ss in control group 2 (the other group of low achievers) worked

an average of 3.25 problems correctly. Control group 1 (the random sample group) did 3.00 problems correctly on the average. Analysis of variance tests showed that the tutored students' mean of 18.42 was significantly better than either of the other two groups at the .01 level. Data from the behavioral observation form showed that tutored students raised their hands significantly (.05) more often than students in the other two groups during the presentation in the mock classroom. It was also shown that tutored students answered correctly significantly (.01) more questions in the mock classroom than did non-tutored students.

Conclusions

From this study it appears profitable, both from a pedagogical viewpoint and from a social viewpoint, to involve low achievers in pre-remedial instruction.

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